International Journal of Environmental Sciences
ISSN: 2229-7359
Vol. 11 No. 15s,2025
https://theaspd.com/index.php

# Severe Tetanus In Elderly With Minor Wound: A Case Report

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***Abstract:*** *Tetanus is a serious infection caused by Clostridium tetani, and it poses a greater risk to the elderly due to factors such as weakened immune systems, underlying health conditions, and incomplete immunization status. While tetanus typically develops from contaminated or severe wounds, in older adults, even minor injuries such as a fish spine puncture can progress to severe generalized tetanus due to delayed inflammatory responses and subtle early symptoms. The aim of this study is to present a case of severe tetanus in an elderly patient resulting from a minor wound and to highlight the importance of early recognition, appropriate immunization, and prompt treatment to prevent fatal outcomes. This study employed a case report method to detail the clinical course of a 79-year-old man who developed severe generalized tetanus following a minor fish spine puncture. It highlights how underlying comorbidities and lack of prior immunization contributed to rapid disease progression and complications requiring intensive care. The report underscores the importance of early diagnosis, preventive vaccination, and aggressive management in elderly patients with even minor wounds. The results of this case report highlight that tetanus in elderly patients tends to be more severe and has a poorer prognosis due to factors such as immunosenescence, multiple comorbidities, and inadequate immunization history. In the reported case, a minor wound led to rapid clinical deterioration, including respiratory failure and cardiac arrest, exacerbated by underlying conditions like diabetes and hypertension. Delayed recognition of early symptoms and late medical intervention further worsened the outcome. This underscores the urgent need for proactive prevention through routine tetanus vaccination, timely administration of HTIG, early antibiotic therapy, and comprehensive management strategies, including mechanical ventilation and multidisciplinary care, to improve survival and quality of life in elderly tetanus patients.*

***Keywords:*** *Tetanus, Elderly, Immunosenescence, Minor Wound, Tetanus Immunoglobulin, Mechanical Ventilation.*

## INTRODUCTION

Tetanus is an infection caused by Clostridium tetani, an anaerobic bacterium that produces a potent neurotoxin called tetanospasmin [1]. This toxin affects the central nervous system by inhibiting the release of inhibitory neurotransmitters, leading to uncontrolled muscle contractions, generalized spasms, and respiratory failure [2]. If not treated promptly and adequately, this infection can be fatal [3].

The global incidence of tetanus remains significant, particularly in regions with limited healthcare access and incomplete vaccination coverage, such as Asia and sub-Saharan Africa. Although the number of reported cases to the WHO has declined from 15,103 in 2018 to 6,679 in 2022, underreporting remains an issue due to weak surveillance systems. Neonatal tetanus also persists, with 2,098 cases reported in 2022 and an estimated 25,000 neonatal deaths in 2018—a 97% reduction since 1988. In contrast, the United States has seen a dramatic decline in tetanus cases due to widespread vaccination, reporting an average of 29 cases annually between 2009 and 2018, primarily affecting individuals aged 50 and older. These data highlight the ongoing need for global immunization efforts and booster awareness, especially among older adults [4].

Tetanus most commonly occurs due to wounds contaminated with soil, dirt, or sharp objects containing C. tetani spores [5]. The risk is higher in individuals with inadequate immunization status [6]. The elderly population is more susceptible to severe tetanus due to several factors, including immunosenescence, comorbid conditions such as diabetes mellitus and hypertension, which impair wound healing, and incomplete or outdated immunization status [7]; [8]. Additionally, elderly individuals often have a slower inflammatory response, making early symptoms of tetanus less recognizable or mistaken for age-related complaints. This can lead to delays in diagnosis and treatment, ultimately increasing disease severity and the risk of death from tetanus [8]. In younger individuals with a more robust immune system and better

immunization coverage, minor wounds rarely lead to severe tetanus. However, in the elderly, even small wounds can progress to a critical condition. Therefore, strict monitoring of any wounds in elderly patients is necessary, and prophylactic administration of tetanus immunoglobulin (HTIG) and tetanus toxoid vaccination should be considered as preventive measures [6]; [9].

Several previous research state that although tetanus is uncommon in modern times, cases continue to arise, particularly among unvaccinated individuals and in developing countries. Maintaining a high index of suspicion and vigilant monitoring, especially for those without immunization history, is crucial for timely diagnosis. Conservative treatment combined with prolonged seizure control, often requiring intensive care unit support, plays a key role in improving patient outcomes [10]. Tetanus has become rare, which has led to decreased situational awareness among frontline healthcare providers. Although they may recognize the classic signs of tetanus, they might overlook important nuances in risk assessment and fail to administer essential post-exposure prophylaxis (PEP). It may be beneficial to implement policies that encourage a proactive approach in preventing tetanus at the first point of contact for example, identifying elderly patients with frequent falls in the emergency department and providing prophylactic tetanus vaccination to this high-risk group [11].

This study presents a novel case highlighting severe tetanus in an elderly patient following a minor fish spine wound, a scenario rarely reported in the literature. Despite the wound appearing insignificant, the patient's advanced age, comorbidities, and lack of documented tetanus immunization contributed to a life-threatening outcome. The aim of this case report is to raise clinical awareness about the potential severity of tetanus in elderly individuals with seemingly minor injuries and to emphasize the importance of preventive measures such as vaccination, proper wound care, and early medical intervention to reduce morbidity and mortality in this vulnerable population.

**Method**

This study employed a case report method to detail the clinical course of a 79-year-old man who presented to the emergency department with severe shortness of breath that began one day prior to admission. Upon arrival, the patient experienced significant respiratory distress and a single seizure episode involving the axial muscles, accompanied by oxygen desaturation and tachycardia. He was immediately transferred to an isolation resuscitation room where he suffered cardiac arrest and underwent cardiopulmonary resuscitation (CPR), followed by intubation and mechanical ventilation. The patient’s history revealed a minor puncture wound on his left leg caused by a fish spine while fishing four days before admission. The wound initially appeared to heal with home care, but two days later, he developed a fever lasting for two days. One day before hospitalization, he began experiencing difficulty swallowing, jaw stiffness, facial rigidity, abdominal and back muscle stiffness, as well as difficulty opening his mouth and choking during eating and drinking.

The patient’s medical history included stage 2 hypertension, type 2 diabetes mellitus, and suspected chronic kidney injury, with no documented history of tetanus immunization. On intensive care unit examination, the patient was sedated due to intubation, with normal neurological reflexes and no signs of meningeal irritation or focal neurological deficits. Classic tetanus signs such as trismus, risus sardonicus, and opisthotonus were initially absent. Laboratory results showed leukocytosis, hypernatremia, and elevated blood glucose, with arterial blood gas analysis indicating metabolic acidosis. He was diagnosed with severe generalized tetanus, classified as Ablett score 4 and Philips score 18, complicated by post-cardiac arrest status, hypertension, hypernatremia, and comorbid conditions. Treatment included administration of tetanus immunoglobulin, antibiotics, supportive therapy, sedation management, and mechanical ventilation. This case highlights the rapid and severe progression of tetanus in elderly patients despite minor wounds, exacerbated by advanced age and underlying comorbidities.

## FINDINGS AND DISCUSSIONS

Elderly patients are more vulnerable to severe complications from tetanus, including respiratory failure requiring mechanical ventilation, uncontrolled muscle spasms, and multi-organ failure caused by immune dysregulation and excessive inflammation. This highlights how aging and immune system changes can worsen

the body's response to tetanus infection and toxin exposure.In this reported case, a 79-year-old man developed severe generalized tetanus following a minor puncture wound from a fish spine. His rapid clinical deterioration marked by respiratory distress, cardiac arrest, and the need for mechanical ventilation illustrates the aggressive nature of tetanus in older adults. The presence of comorbidities such as hypertension, diabetes mellitus, and suspected chronic kidney disease likely contributed to the worsening disease course.Additionally, the patient's lack of documented tetanus immunization increased his susceptibility to severe disease. Delayed medical attention further aggravated his condition, underscoring the critical need for heightened clinical suspicion and prompt intervention to prevent fatal outcomes, especially in elderly patients with underlying health conditions.Based on the findings, this case highlights the critical impact of aging and comorbidities on the severity of tetanus. The patient's need for mechanical ventilation, uncontrolled muscle spasms, and signs of potential multi-organ failure suggest that immune dysregulation and excessive inflammation play a key role in disease progression in the elderly. These factors, combined with the absence of tetanus immunization and delayed medical care, emphasize the importance of early recognition, vaccination, and prompt treatment to prevent severe complications and mortality in similar high-risk populations.

Although the overall success rate of tetanus treatment in China has significantly improved, the prevention and control of non-neonatal tetanus remain challenging. Greater emphasis should be placed on adult tetanus prevention and the standardized use of sedatives and antispasmodics. Additionally, medical professionals should work to raise public awareness about tetanus prevention and treatment while strengthening clinical training at grassroots healthcare facilities.Tetanus in elderly individuals generally carries a poorer prognosis than in younger patients, even when the initial injury seems minor [12]. This is largely due to immunosenescence a natural decline in immune function with age which reduces the body's ability to mount an effective immune response. As a result, older adults are less capable of neutralizing tetanus toxins and producing adequate levels of protective antibodies after exposure to *Clostridium tetani.* This compromised immunity increases the risk of severe complications and highlights the importance of preventive measures, such as timely vaccination and early clinical intervention, in this vulnerable population [13]; [14].In elderly patients, common comorbidities such as diabetes mellitus and chronic kidney disease significantly contribute to the poor prognosis of tetanus [15]. These conditions impair the body's ability to heal wounds effectively and increase the likelihood of secondary infections, which can complicate clinical management. Additionally, hypertension and cardiovascular diseases can destabilize hemodynamic function during the acute stages of tetanus, increasing the risk of complications such as arrhythmias or hypotensive crises, thereby worsening outcomes [16].Another critical factor is the often incomplete or outdated immunization status among older adults. Many in this age group have not received the full course of tetanus vaccinations or timely booster shots, leading to waning immunity [17]. This vulnerability is exacerbated by a general lack of awareness about the need for adult immunization, especially in rural or underserved populations. As a result, these individuals are at increased risk of developing severe tetanus after injury, emphasizing the need for targeted public health interventions and routine vaccination assessments in the elderly population [18].Delayed diagnosis and treatment significantly contribute to the worsening prognosis of tetanus, particularly in the elderly. Initial symptoms like mild muscle stiffness or jaw tightness are frequently overlooked or misattributed to common musculoskeletal conditions, leading to missed opportunities for timely medical evaluation. This lack of early recognition hinders the prompt administration of lifesaving interventions such as human tetanus immunoglobulin (HTIG) and appropriate antibiotic therapy [19].As the disease progresses without proper treatment, patients are more likely to develop severe complications, including uncontrolled muscle spasms, respiratory failure, or autonomic instability. These advanced symptoms not only require intensive care but also carry a higher risk of mortality, especially in those with underlying health conditions. Therefore, increasing clinical awareness and early identification of tetanus symptoms are essential for improving outcomes and reducing fatality rates [20].Elderly patients are particularly vulnerable to severe complications from tetanus, such as respiratory failure that necessitates mechanical ventilation, persistent and uncontrolled muscle spasms, and multi-organ failure. These complications are often driven by age-related immune system

decline known as immunosenescence which leads to impaired regulation of the immune response and heightened systemic inflammation. This weakened physiological resilience makes it more difficult for older individuals to contain the effects of *Clostridium tetani* toxins, resulting in a more aggressive disease course and poorer clinical outcomes.This case illustrates how even a seemingly minor wound can lead to life-threatening complications in elderly individuals due to tetanus. A 79-year-old man rapidly progressed from a puncture injury to severe generalized tetanus, marked by respiratory failure and cardiac arrest requiring intensive support. His multiple comorbid conditions, such as hypertension, diabetes, and possible chronic kidney disease, likely compounded his vulnerability and worsened the progression of the disease. The absence of a recorded tetanus immunization history further increased his risk, revealing a critical gap in preventive healthcare for the elderly. Moreover, delayed medical attention following the injury allowed the infection to advance unchecked. This case emphasizes the urgent need for improved awareness, timely diagnosis, and preventive strategies especially tetanus vaccination and early wound management in older populations at higher risk for poor outcomesManagement of tetanus in the elderly should be more aggressive than in younger patients. Key steps include prophylactic administration of HTIG and vaccination for all minor wounds without a clear immunization history, early antibiotic therapy to prevent the growth of C. tetani, and strict spasm management using a combination of sedation and muscle relaxants.Timely recognition and immediate intervention are essential in managing tetanus, as antitoxin therapies like immunoglobulins are only effective against circulating toxins and cannot reverse those already attached to nerve tissue. Early administration helps limit disease progression, but once neurological binding has occurred, symptom control becomes significantly more difficult. Some studies suggest that intrathecal delivery of immunoglobulin may offer improved outcomes compared to intramuscular injection, potentially allowing for more direct targeting of the central nervous system. However, in specific forms like cephalic tetanus, the efficacy of this approach remains uncertain and warrants further investigation [21]. Initiating early mechanical ventilation is vital in tetanus cases to prevent hypoxia resulting from spasms in the laryngeal and respiratory muscles, which can rapidly lead to respiratory failure. Supportive therapies such as magnesium sulfate have shown promise in controlling muscle spasms and may reduce the reliance on sedatives and muscle relaxants. Preventing tetanus through optimal wound management is vital. Tetanus toxoid and HTIG should be administered immediately after injury, even in patients with a history of tetanus infection. Unfortunately, studies show that many patients with high-risk wounds do not receive appropriate prophylaxis, and physician compliance with national guidelines remains low. Therefore, education and training for healthcare providers on tetanus prevention protocols should be enhanced. A multidisciplinary approach, involving specialists from neurology, anesthesiology, internal medicine, and rehabilitation, is essential to enhance the outcomes for elderly patients with tetanus. Coordinated and timely care ensures that all aspects of the disease from managing neurological symptoms and respiratory support to addressing underlying health conditions and facilitating recovery are effectively addressed. This comprehensive strategy not only helps preserve patients' quality of life but also contributes to lowering mortality rates associated with severe tetanus in older adults.

## CONCLUSION

Tetanus in the elderly follows a more severe clinical course and has a worse prognosis compared to younger individuals. Immunosenescence, comorbidities, and inadequate immunization status contribute to increased disease severity and high mortality rates. Even minor wounds in the elderly can become life-threatening due to delayed diagnosis and treatment. Increasing awareness and preventive measures, such as routine tetanus vaccination and wound management vigilance, are essential to reducing the incidence of severe tetanus in this population.

**Acknowledgment**

The authors would like to extend their gratitude to all the individuals and institutions who provided valuable support throughout this research. Special thanks to Universitas Negeri Yogyakarta, Universitas Negeri Yogyakarta, Institut Prima Bangsa, whose facilities and encouragement were instrumental in the study's completion.

**Ethical considerations**

Not applicable.

**Conflict of interest**

The authors declare that they have no conflicts of interest.

**Funding**

This research did not receive any financial support.

## REFERENCES

[1] M. Pal, T. Rebuma, M. Regassa, and F. Tariku, "Animal and human tetanus: An overview on transmission, pathogenesis, epidemiology, diagnosis, and control," *J Adv Microbiol Res*, vol. 5, no. 1, pp. 22–26, 2024.

[2] I. Karunarathna *et al.*, "Intensive Care Management of Tetanus: Current Strategies and Challenges," *Uva Clin. Lab. Retrieved from Res.*, 2024.

[3] W. M. Ibrahim, A. S. Ati, and S. S. Majeesd, "Sustainability of agricultural productivity and water requirement of sorghum crop under deficient irrigation," in *IOP Conference Series: Earth and Environmental Science*, IOP Publishing, 2023, p. 82012.

[4] A. Filia *et al.*, "Tetanus in Italy 2001–2010: a continuing threat in older adults," *Vaccine*, vol. 32, no. 6, pp. 639–644, 2014.

[5] J. Hirai, N. Mori, Y. Shibata, N. Asai, M. Hagihara, and H. Mikamo, "Tetanus Following Canine Bite in Japan: A Case Report and Literature Review," *Infect. Drug Resist.*, pp. 7427–7434, 2023.

[6] H. Blencowe, J. Lawn, J. Vandelaer, M. Roper, and S. Cousens, "Tetanus toxoid immunization to reduce mortality from neonatal tetanus," *Int. J. Epidemiol.*, vol. 39, no. suppl_1, pp. i102–i109, 2010.

[7] X. Lu, H. E. Quinn, R. I. Menzies, L. Hueston, and P. B. McIntyre, "Tetanus immunity and epidemiology in Australia, 1993-2010," *Infect. Disord. TargetsDisorders)*, vol. 20, no. 3, pp. 330–340, 2020.

[8] A. Hart *et al.*, "The impact of diabetes mellitus on wound healing in breast reconstruction," *Ann. Plast. Surg.*, vol. 78, no. 3, pp. 260–263, 2017.

[9] S. Collins, J. White, M. Ramsay, and G. Amirthalingam, "The importance of tetanus risk assessment during wound management," *IDCases*, vol. 2, no. 1, pp. 3–5, 2015.

[10]M. A. A. Nugraha, I. K. Sumada, and D. Yuliani, "Tetanus generalisata pada lansia: sebuah laporan kasus," *Intisari Sains Medis*, vol. 14, no. 3, pp. 1405–1408, 2023.

[11]S. P. Sah, S. Khanal, S. Dahal, A. Shrestha, and B. Pradhan, "Generalized tetanus in an elderly patient: A case report," *Ann. Med. Surg.*, vol. 81, 2022.

[12]H. Isono *et al.*, "Tetanus in the elderly: the management of intensive care and prolonged hospitalization," *Intern. Med.*, vol. 55, no. 22, pp. 3399–3402, 2016.

[13]A. Agrawal and B. Weinberger, "The impact of immunosenescence and senescence of immune cells on responses to infection and vaccination," *Frontiers in Aging*, vol. 3. Frontiers Media SA, p. 882494, 2022.

[14]A. Wagner *et al.*, "Age-related differences in humoral and cellular immune responses after primary immunisation: indications for stratified vaccination schedules," *Sci. Rep.*, vol. 8, no. 1, p. 9825, 2018.

[15]J. Zhou *et al.*, "Prevalence and prognosis of hard-to-heal wounds with comorbidities in China," *J. Wound Care*, vol. 31, no. Sup10, pp. S7–S15, 2022.

[16]N. Amaliah and I. I. Wardhany, "DENTIST'S ROLE IN COLLABORATIVE MANAGEMENT OF TETANUS PATIENT," *J. Heal. Dent. Sci.*, vol. 3, no. 3, pp. 303–316, 2024.

[17]F. Shumy *et al.*, "Treatment of tetanus in ICU: a case report," *Bangladesh Crit. Care J.*, vol. 1, no. 1, pp. 56–58, 2013.

[18]F. Ayub *et al.*, "Revitalizing tetanus vaccine literacy post road accidents: a comprehensive examination of knowledge and awareness initiative among non-medical university students in Lahore, Pakistan," *Front. Immunol.*, vol. 15, p. 1468356, 2024.

[19]Y. Okazaki, T. Ichiba, N. Fujisaki, and S. Urushidani, "Understanding the trajectory to a diagnosis of tetanus: a descriptive study," *Cureus*, vol. 15, no. 1, 2023.

[20]Y. Gou, S.-M. Li, J.-F. Zhang, X.-P. Hei, B.-H. Lv, and K. Feng, "6084 Cases of adult tetanus from China: a literature analysis," *Infect. Drug Resist.*, pp. 2007–2018, 2023.

[21]M. Bernardes, S. Lo Presti, and K. Ratzan, "A case of cephalic tetanus in an elderly patient with trismus," *Case Rep. Infect. Dis.*, vol. 2018, no. 1, p. 1247256, 2018.